

CLAIMS:

1. An apparatus for opening/closing a door, the apparatus comprising:

sensing means for sensing a password inputted by a user and outputting a sensing signal;

controlling means for determining validity of the password based on the sensing signal and outputting a control signal according to a determining result; and

door opening/closing means for opening/closing the door according to the control signal.

2. The apparatus according to claim 1, further comprising signal processing means for processing the sensing signal using a key signal outputted from the controlling means so that the sensing signal is normally outputted without any malfunction.

3. The apparatus according to claim 2, wherein the signal processing means comprises:

a key signal converting section for differentiating the key signal outputted from the controlling means and outputting an impulse signal;

a key signal combining section for combining the impulse signal and another impulse signal and outputting a combined signal; and

a logic operation section for performing logic operation using the combined key signal so that the sensing signal is outputted normally without any malfunction.

5 4. The apparatus according to claim 3, wherein when the sensing signal remains in a previous state during a period of a next key signal outputted from the controlling means, the impulse signal switches the sensing signal.

10 5. The apparatus according to claim 2, wherein some of the key signal outputted from the controlling means is inputted to the sensing means and used to ascertain whether or not the user inputs the password.

15 6. The apparatus according to claim 1, further comprising:

password input start means for releasing a sleep mode before the user inputs the password so that the password is
20 inputted normally; and

door opening/closing ascertaining means for ascertaining whether or not the password is set normally after the password is set.

25 7. The apparatus according to claim 1, further comprising:

sound output means for reporting to the user acoustically whether or not the password is inputted and set normally; and

storage means for storing the set password used to
5 determine whether or not the password is set and inputted by the user normally.

8. The apparatus according to claim 1, further comprising:

10 password mode selection means for selecting a mode of the password which the user should input so as to set the password; and

electronic door opening/closing means for allowing the user to open and close the door inside the door.

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9. The apparatus according to claim 1, wherein the sensing means comprises:

a plurality of touch sensors arranged at predetermined positions, for inputting or setting the
20 password by a user's touch; and

a touch detecting section correspondingly connected to the plurality of touch sensors, for sensing a touch of the user and outputting a corresponding sensing signal.

25 10. The apparatus according to claim 9, wherein the touch sensors become conductive through a medium of human

being when the human being touches the touch sensors.

11. The apparatus according to claim 9, wherein the touch detecting section senses whether or not the human being touches the touch sensors using a static capacitance of the human body when the human being touches the touch sensors.

12. The apparatus according to claim 1, wherein the door opening/closing means comprises:

a door opening/closing driving section for driving a driving motor according to the control signal outputted from the controlling means and rotating a link member connected to the driving motor; and

a door opening/closing operation section connected to the link member, and slidably moving in a direction according to a rotation of the link member.

13. The apparatus according to claim 1, wherein the validity of the passwords is determined using an arrangement order of the passwords.

14. The apparatus according to claim 13, wherein the validity of the password is determined by number of the password.

15. The apparatus according to claim 1, wherein the controlling means comprises a port for determining which touch sensor of a plurality of touch sensors included in the sensing means outputs the sensing signal.

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16. A method of opening/closing a door, the method comprising the steps of:

(a) sensing a password inputted by a user and outputting a sensing signal;

10 (b) determining validity of the password based on the sensing signal and outputting a control signal according to a determining result; and

(c) opening the door according to the control signal.

15 17. The method according to claim 16, wherein the step (a) comprises the steps of:

(a-1) releasing a sleep mode by using password input start means;

20 (a-2) allowing the user to touch a plurality of touch sensors so as to input the password using the plurality of touch sensors arranged at predetermined positions; and

(a-3) generating a sensing signal in response to the touch of the plurality of touch sensors.

25 18. The method according to claim 17, wherein the sensing signal is generated by using static capacitance

stored in a human body as a source.

19. The method according to claim 16, wherein the step (b) comprises the steps of:

- 5 (b-1) receiving at least one sensing signal generated when the user touches the touch sensors;
- (b-2) arranging at least one sensing signal in an input order and generating a password key;
- (b-3) determining whether or not the password key
10 accords with a previously set password key; and
- (b-4) when the password key accords with the previously set password key, outputting a control signal for controlling the door.

15 20. The method according to claim 19, wherein the step (b) further comprises the step of: (b-5) processing the at least one sensing signal using a key signal so as to prevent the at least one sensing signal from malfunctioning.

20 21. The method according to claim 20, wherein the key signal is outputted from the controlling means.

22. The method according to claim 19, wherein the step (b-3) is performed based on arrangement order and
25 number of the sensing signals.

23. The method according to claim 16, wherein the step (c) comprises the steps of:

(c-1) driving a driving motor according to the control signal;

5 (c-2) rotating a link member in response to a driving of the driving motor; and

(c-3) slidably moving a door opening/closing operation section connected to the link member in a direction according to a rotation of the link member.

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